



(19)

(11) Publication number:

00

Generated Document.

**PATENT ABSTRACTS OF JAPAN**(21) Application number: **05164993**(51) Intl. Cl.: **H01Q 3/24 G01S 3/04 H01Q 21/20**(22) Application date: **11.06.93**

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**(54) ANTENNA SYSTEM**

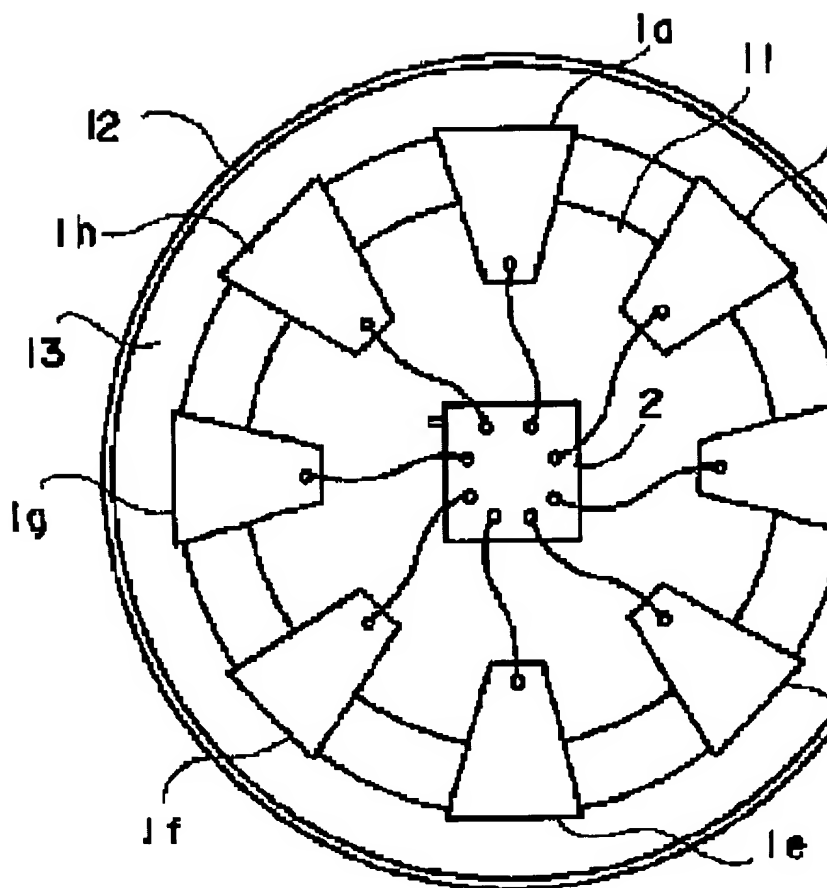
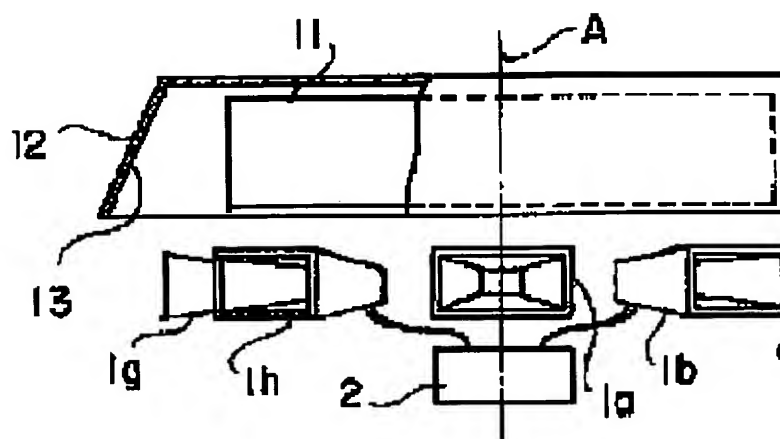
(57) Abstract:

**PURPOSE:** To confirm the reception operating state of a succeeding circuit by reflecting a test signal radio wave radiating from an entire circumference of an omnidirectional antenna in a reflecting member and inputting to the reflected wave to plural directivity antennas and connecting them to the succeeding circuit, in which the radio wave is analyzed.

**CONSTITUTION:** An omnidirectional antenna 11 emits a test signal received externally from its entire circumference. The radio wave is reflected in a reflection inner face 13 of a reflecting plate 12 tilted to be open toward each of directivity antennas 1a-1h and the reflected wave is inputted to the antennas 1a-1h. A switch 2 is sequentially switched to connect each of the antennas 1a-1h to a succeeding circuit and the reception operation of the

antennas 1a-1h and the succeeding circuit is confirmed by analyzing an output signal of the succeeding circuit based on the test signal. Thus, even when the number of the antennas 1a-1h is increased, since the testing is attained by revising the switch 2 corresponding to the increase, one set of the antenna 11 and the reflecting plate 12 is enough for the purpose. Thus, the system configuration is more simplified than that in a conventional system with the more reception antennas are used and then the cost is reduced that much.

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(19) 日本国特許庁 (JP)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平 6 - 3 5 0 3 2 6

(43) 公開日 平成6年 (1994) 12月22日

(51) Int. Cl. <sup>5</sup>	識別記号	庁内整理番号	F I	技術表示箇所
H 0 1 Q	3/24	2109 - 5 J		
G 0 1 S	3/04	C 8113 - 5 J		
H 0 1 Q	1/50	7037 - 5 J		
	21/20	2109 - 5 J		

審査請求 未請求 請求項の数 3

F D

(全 6 頁)

(21) 出願番号 特願平5-164993

(22) 出願日 平成5年 (1993) 6月11日

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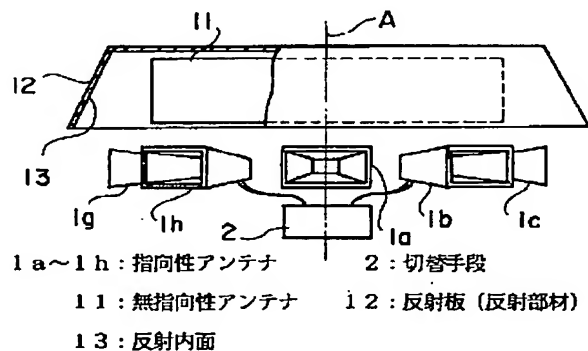
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(54) 【発明の名称】 空中線装置

(57) 【要約】

【目的】 同一の軸線Aを中心として放射状に配置され、所定の後続回路に接続されて、各方位から到来する電波の受信を行なう複数の指向性アンテナ1a~1hからなる空中線装置において、構成を簡単にするとともに、アンテナも含めた装置全体の作動状況が確認できるようにする。

【構成】 指向性アンテナ1a~1hのうちのいずれかを前記後続回路に切替えて接続する切替手段2と、前記軸線Aを中心として指向性アンテナ1a~1hに隣接して配設され、試験電波を放射する無指向性アンテナ11と、この無指向性アンテナ11から放射された電波を指向性アンテナ1a~1hそれぞれに入射させる反射部材12とを設ける。



## 【特許請求の範囲】

【請求項1】 同一の軸線を中心として放射状に配置され、所定の後続回路に接続されて、各方位から到来する電波の受信を行なう複数の指向性アンテナからなる空中線装置において、前記指向性アンテナのうちのいずれかを前記後続回路に切替えて接続する切替手段と、前記軸線を中心として前記指向性アンテナに隣接して配設され、試験電波を放射する無指向性アンテナと、この無指向性アンテナから放射された電波を前記指向性アンテナそれぞれに入射させる反射部材とを具備したことを特徴とする空中線装置。

【請求項2】 前記反射部材は、前記無指向性アンテナの全周を囲むように配置されて、前記試験電波を各指向性アンテナに入射させるべく、前記指向性アンテナの側に開口する円錐台形状の反射板より構成し、この反射板を前記軸線を中心として回転駆動可能とするとともに、前記反射板の反射内面上には、前記試験電波を吸収する電波吸収体を、前記反射内面の一部を除く全周に渡って配設したことを特徴とする請求項1記載の空中線装置。

【請求項3】 前記切替手段は、前記無指向性アンテナと後続回路とを接続する各電路の途上にそれぞれ設けられた複数の電路開閉スイッチよりなることを特徴とする請求項1記載の空中線装置。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】この発明は、複数の指向性アンテナにより各方位から到来する電波を受信する空中線において、各指向性アンテナとそれらに接続する後続回路の作動状況が容易かつ確実に点検できる空中線装置に関するものである。

## 【0002】

【従来の技術】図7は従来の空中線装置の構成を示すブロック図であり、図において、1a~1hは水平面に沿って放射状に配列設置される指向性アンテナ、2は前記各アンテナ1a~1hのうちいずれ一つを後続回路に接続するための切替スイッチ、3a~3hは前記各アンテナ1a~1hと切替スイッチ2との間にそれぞれ挿入された結合器、4は入力信号の電力を分配する分配器である。なおここで、後続回路とは、各アンテナ1a~1hにより受信された補捉信号を処理加工して所定の信号

(例えば音声出力あるいは映像表示のための信号)として出力する処理回路、あるいは、各アンテナ1a~1hにより受信された補捉信号に基づいて電波の到来方向を判定する処理回路等である。また、結合器3a~3hの代りに、アンテナ1a~1hからの信号と分配器4からの信号のいずれかを切替スイッチ2に接続するかを切り替える接続切替スイッチが設けられる場合もある。

【0003】次に動作について説明する。通常の受信動作においては、各アンテナ1a~1hは、各々が有する放射方向からの入射電波を補捉し、この補捉信号をそれ

ぞれに接続された結合器3a~3hを介して切替スイッチ2に送る。そして、切替スイッチ2は、各アンテナ1a~1hから入力される補捉信号を適宜切替えて後続回路に出力し、後続回路においては、これら補捉信号から所定の信号が取り出され、あるいは電波の到来方向等が判定される。

【0004】一方、装置の作動状況を確認する試験動作においては、分配器4は外部から入力される試験信号をアンテナ1a~1hの数(この場合8個)に合せ分配して結合器3a~3hに送り、各結合器3a~3hがこの試験信号をアンテナ1a~1hと切替スイッチ2を結ぶ各電路に注入する。すると、注入された試験信号は切替スイッチ2を通り後続回路へ出力される。このため、この際後続回路から出力される信号等を分析することにより、空中線装置の作動状況の点検が行なえる。

## 【0005】

【発明が解決しようとする課題】従来の空中線装置は以上のように構成されているので、試験信号を注入するために、アンテナ1a~1hの数だけの結合器3a~3hあるいは前述した接続切替スイッチが必要であり、さらに試験信号をこれらアンテナ1a~1hそれぞれに分配する分配器4が必要であるから、アンテナの数が多くなればなる程、部品点数が増大し回路が複雑になって高価なものとなるという問題点があった。

【0006】また、試験信号は、アンテナ1a~1hを介して注入されないため、各アンテナ1a~1hの作動状況は確認できず、アンテナ1a~1hの異常が検出できないという問題点があった。

【0007】さらに、上記従来の装置では、所定の方

30 から電波が到来してアンテナ1a~1hに受信されるような状況を試験的に作り出すことができないので、前記後続回路が各アンテナ1a~1hの受信レベルを比較して電波の到来方向(入射方向)を判定する機能(方位探知機能)を有するものである場合(すなわち、空中線装置がいわゆる方位探知装置の一部として使用される場合)に、この方位探知機能の動作状況を点検することはできないなどの問題点があった。

【0008】なお、本発明に関連する従来技術としては、例えば特開平1-254007号公報等

40 示されたものがあるが、上記問題点あるいはこれを解決する手段等については記載されていない。

【0009】この発明は上記のような問題点を解消するためになされたもので、部品点数が少なく回路が簡単で安価であり、しかもアンテナや後続回路の機能も含めた装置全体の作動状況が確認できる空中線装置を提供することを目的としている。

## 【0010】

【課題を解決するための手段】請求項1記載の発明に係る空中線装置は、同一の軸線を中心として放射状に配置され、所定の後続回路に接続されて、各方位から到来す

る電波の受信を行なう複数の指向性アンテナからなる空中線装置であって、前記指向性アンテナのうちのいずれかを前記後続回路に切替えて接続する切替手段と、前記軸線を中心として前記指向性アンテナに隣接して配設され、試験電波を放射する無指向性アンテナと、この無指向性アンテナから放射された電波を前記指向性アンテナそれぞれに入射させる反射部材とを具備したものである。

【0011】請求項2記載の発明に係る空中線装置は、請求項1記載の空中線装置において、前記反射部材を、前記無指向性アンテナの全周を囲むように配置されて、前記試験電波を各指向性アンテナに入射させるべく、前記指向性アンテナの側に開口する円錐台形状の反射部材により構成し、この反射部材を前記軸線を中心として回転駆動可能とするとともに、前記反射部材の反射内面上には、前記試験電波を吸収する電波吸収体を、前記反射内面の一部を除く全周に渡って配設したものである。

【0012】請求項3記載の発明に係る空中線装置は、請求項1記載の空中線装置において、前記切替手段を、前記無指向性アンテナと後続回路とを接続する各電路の途上にそれぞれ設けた複数の電路開閉スイッチより構成したものである。

【0013】

【作用】請求項1記載の発明における無指向性アンテナは、外部からの試験信号を電波として全周から放射する。すると、この放射電波は反射部材により反射して各指向性アンテナに入力される。このため、切替手段を順次切り替えて各指向性アンテナを後続回路に接続し、この際の後続回路における出力信号等を試験信号に対して分析すれば、各指向性アンテナ及び後続回路の受信動作状況を確認できる。

【0014】また、請求項2記載の発明における電波吸収体は、無指向性アンテナから放射される試験電波を反射板の一部を除いて吸収するから、反射板により反射して指向性アンテナの側に入射する試験電波は、反射板において前記電波吸収体が設けられていない一部におけるもののみとなる。しかも、反射部材を構成する反射板は回転駆動可能であるから、このように吸収されないで反射する試験電波の位置を全周に渡って変化させることができる。

【0015】このため、特定の方位より電波が到来する実際の受信状況を試験的に作り出すことができ、後続回路が方位探知機能を有する場合に、この機能の作動状況をも確認できる。すなわち、前記反射板を回転させて試験電波が反射する位置を各種設定し、この際の後続回路における方位探知機能の判定結果を前記設定位置に対して分析すればよい。

【0016】さらに、請求項3記載の発明における切替手段は、無指向性アンテナと後続回路とを接続する各電路の途上にそれぞれ設けた複数の電路開閉スイッチより

構成されているので、指向性アンテナの数が増えても、同種の部品（すなわち前記電路開閉スイッチ）の数を増やすだけで装置を容易に構成できる。

【0017】

【実施例】実施例1. 以下、請求項1記載の発明の一実施例を図1～3により説明する。図1は各構成要素の配置を示す側面図、図2は各構成要素の配置を示す下面図、図3は各構成要素の接続を示すブロック図である。図1において、Aは水平面に沿って放射状に配列された各アンテナ1a～1h（指向性アンテナ）の配列の中心である軸線、11は各アンテナ1a～1hの上側に隣接する高さに軸線Aを中心として配設されたドラム状の無指向性アンテナ、12は無指向性アンテナ11の全周及び上面を囲むように配置されて試験電波を各アンテナ1a～1hに入射させる円錐台形状の反射板（反射部材）である。なお、図1～3において、前記図7に示す従来の装置と同様の要素には同符号を付してある。

【0018】次に動作について説明する。上記空中線装置における無指向性アンテナ11は、外部から入力される試験信号を電波として全周から放射する。すると、この放射電波は、反射板12において各アンテナ1a～1h側に開くように傾斜する反射内面13により反射して各アンテナ1a～1hに入力される。このため、切替スイッチ2（切替手段）を順次切り替えて各アンテナ1a～1hを後続回路に接続し、この際の後続回路における出力信号等を試験信号に対して分析すれば、各アンテナ1a～1h及び後続回路の受信動作状況を確認できる。

【0019】そして、上記装置によれば、受信用のアンテナ1a～1hの数をさらに増加させる場合でも、切替スイッチ2をそれに対応させて変更するだけで、通常の受信動作も上記試験動作も可能となるので、部品点数を少なく維持しかつ回路を簡単に保つことができる。すなわち、前述した図7に示す従来の装置の場合には、受信用のアンテナが増加した分だけ、切替スイッチ2及び分配器4を容量の大きなものに替えるとともに、結合器3a～3hの数を増やさなければならないが、上記装置の場合、無指向性アンテナ11と反射板12はあくまで一組みあればよいのである。したがって、受信用のアンテナの数が多ければ多いほど、装置の構成を従来よりも簡単にしてコスト低減を図ることができる効果がある。

【0020】実施例2. 次に、請求項2記載の発明の一実施例を図4、5により説明する。図4、5は構成要素の配置を示す側面図あるいは下面図である。図4、5において、14は反射板12の反射内面13上に一部を除き装着された電波吸収体であり、反射板12は図示省略した回転駆動手段により前記軸線Aを中心として回転する構成となっている。

【0021】次に動作について説明する。上記空中線装置における電波吸収体14は、無指向性アンテナ11から放射される試験電波を反射板12の一部を除いて吸収

するから、反射板12により反射してアンテナ1a~1hの側に入射する試験電波は、反射板12において電波吸収体14が設けられていない一部におけるもののみとなる。しかも、反射板12は回転駆動可能であるから、このように吸収されないで反射する試験電波の位置を軸線Aの回り全周に渡って変化させることができる。

【0022】このため、特定の方位より電波が到来する実際の受信状況を試験的に作り出すことができ、後続回路が方位探知機能を有する場合に、この機能の作動状況をも確認できる。すなわち、反射板12を回転させて試験電波が反射する位置を各種設定し、この際の後続回路における方位探知機能の判定結果を設定位置に対して分析すれば、前記機能の異常あるいは性能の劣化等を検出することができる。

【0023】実施例3。次に、請求項3記載の発明の一実施例を図6により説明する。図6において、15a~15hは無指向性アンテナ11と後続回路とを接続する各電路の途上にそれぞれ設けられた複数の電路開閉スイッチであり、前記実施例1における切替スイッチ2に相当する切替手段を構成するものである。

【0024】この装置の場合も、実施例1の装置と同様に、アンテナ1a~1hを含めた装置全体の受信動作状況が確認できるとともに、従来の装置における分配器4及び結合器3a~3hを削除してコスト低減を図ることができるが、さらに以下の効果がある。すなわち、アンテナ1a~1hの数が増えても、切替手段は常に同種の部品（すなわち前記電路開閉スイッチ）の数を増やすだけで装置を構成できるので、量産効果等により顕著にコスト低減を図ることができるとともに、装置の組立工程等における部品の管理が容易となる。

【0025】

【発明の効果】以上のように、請求項1記載の発明によれば、同一の軸線を中心として放射状に配置され、所定の後続回路に接続されて、各方位から到来する電波の受信を行なう複数の指向性アンテナからなる空中線装置の指向性アンテナのうちのいずれかを前記後続回路に切替えて接続する切替手段と、前記軸線を中心として前記指向性アンテナに隣接して配設され、試験電波を放射する無指向性アンテナと、この無指向性アンテナから放射された電波を前記指向性アンテナそれぞれに入射させる反射部材とを具備するように構成したので、空中線装置が

簡単になりコスト低減が図れるとともに、受信用のアンテナ自体の異常等が検出できるようになる。特にアンテナ数が多いときには大幅なコスト低減を実現できる。

【0026】さらに、請求項2記載の発明によれば、反射部材を、無指向性アンテナの全周を囲むように配置されて、試験電波を各指向性アンテナに入射させるべく、指向性アンテナの側に開口する円錐台形状の反射部材により構成し、この反射部材を軸線を中心として回転駆動可能とするとともに、前記反射部材の反射内面上には、前記試験電波を吸収する電波吸収体を、前記反射内面の一部を除く全周に渡って配設するように構成したので、アンテナに接続される後続回路が方位探知を有する場合、この機能の異常等をも検出できる効果がある。

【0027】また、請求項3記載の発明によれば、切替手段を無指向性アンテナと後続回路とを接続する各電路の途上にそれぞれ設けた複数の電路開閉スイッチより構成したので、さらに顕著にコスト低減を図ることができるとともに、装置の組立工程等における部品管理が容易となる効果がある。

20 【図面の簡単な説明】

【図1】請求項1記載の発明の一実施例による空中線装置の側面図である。

【図2】請求項1記載の発明の一実施例による空中線装置の下面図である。

【図3】請求項1記載の発明の一実施例による空中線装置の各構成要素の接続状態を示すブロック図である。

【図4】請求項2記載の発明の一実施例による空中線装置の側面図である。

30 【図5】請求項2記載の発明の一実施例による空中線装置の下面図である。

【図6】請求項3記載の発明の一実施例による空中線装置を示すブロック図である。

【図7】従来の空中線装置を示すブロック図である。

【符号の説明】

1a~1h 指向性アンテナ

2 切替手段

11 無指向性アンテナ

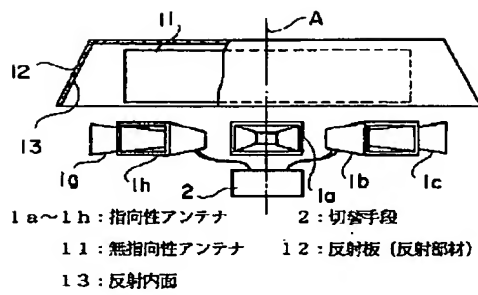
12 反射板（反射部材）

13 反射内面

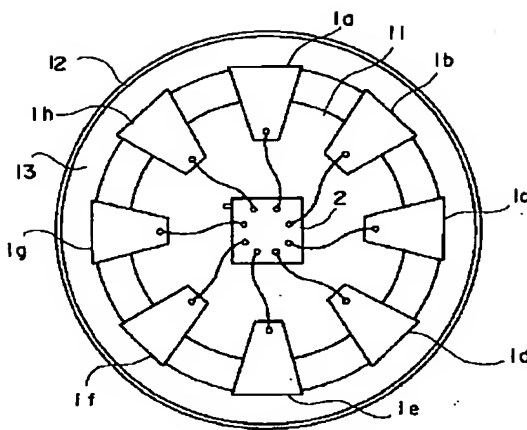
40 14 電波吸収体

15a~15h 電路開閉スイッチ

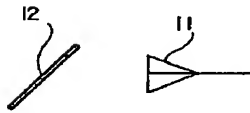
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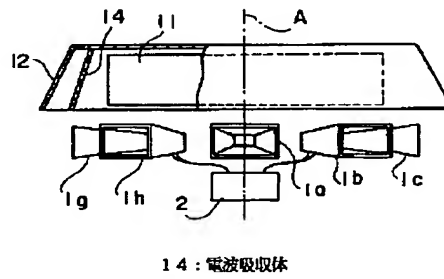
【図2】



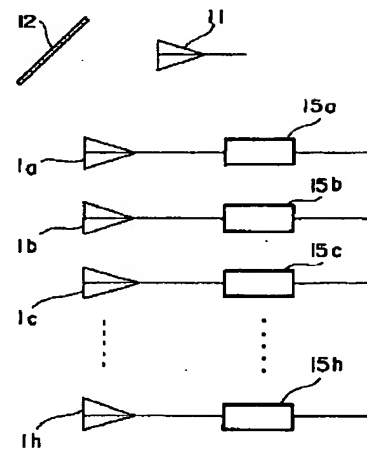
【図3】



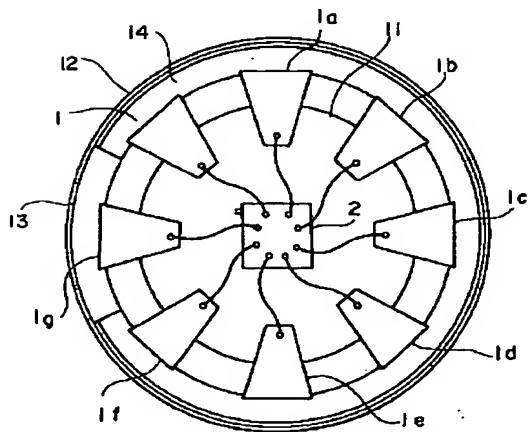
【図4】



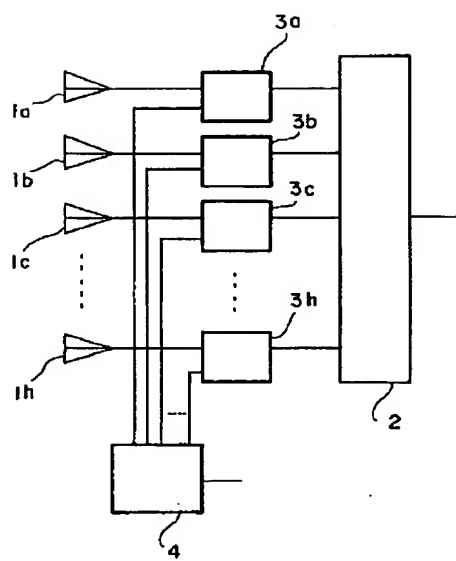
【図6】



【図5】



【図 7】





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Bibliography

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(19) [Publication country] Japan Patent Office (JP)  
(12) [Kind of official gazette] Open patent official report (A)  
(11) [Publication No.] JP, 6-350326, A  
(43) [Date of Publication] December 22, Heisei 6 (1994)  
(54) [Title of the Invention] Antenna unit  
(51) [The 5th edition of International Patent Classification]  
H01Q 3/24 2109-5J  
G01S 3/04 C 8113-5J  
H01Q 1/50 7037-5J  
21/20 2109-5J  
[Request for Examination] Un-asking.  
[The number of claims] 3  
[Mode of Application] FD  
[Number of Pages] 6  
(21) [Application number] Japanese Patent Application No. 5-164993  
(22) [Filing date] June 11, Heisei 5 (1993)  
(71) [Applicant]  
[Identification Number] 000006013  
[Name] Mitsubishi Electric Corp.  
[Address] 2-2-3, Marunouchi, Chiyoda-ku, Tokyo  
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[Address] 8-1-1, Tsukaguchihommachi, Amagasaki-shi The Mitsubishi  
Electric Corp. transmitter manufacture within a station  
(74) [Attorney]  
[Patent Attorney]  
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[Translation done.]

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Epitome

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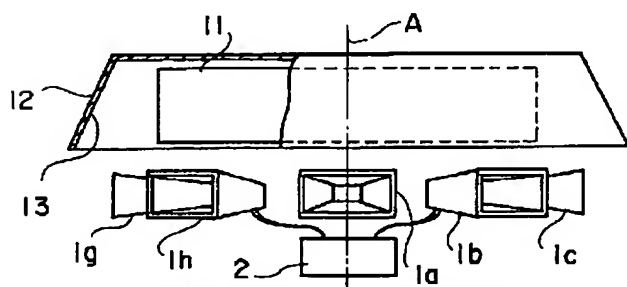
(57) [Abstract]

[Objects of the Invention] It is arranged focusing on the same axis A at a radial, and connects with a predetermined consecutiveness circuit, and while simplifying a configuration, it enables it to check the actuation situation of the whole equipment also including an antenna in the antenna unit which consists of two or more directional antennas 1a-1h which receive the electric wave which comes from all directions grade.

[Elements of the Invention] the electric wave emitted from a change means 2 to change either of the directional antennas 1a-1h to said consecutiveness circuit, and to connect, the nondirectional antenna 11 which adjoins directional antennas 1a-1h, is arranged focusing on said axis A, and emits a trial electric wave, and this nondirectional antenna 11 -- a directional antenna 1 -- the reflective member 12 which boils, respectively and carries out incidence a-1h is formed.

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[Translation done.]



- 1 a ~ 1 h : 指向性アンテナ      2 : 切替手段  
1 1 : 無指向性アンテナ      1 2 : 反射板 (反射部材)  
1 3 : 反射内面
-

[Translation done.]

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CLAIMS

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[Claim(s)]

[Claim 1] The antenna unit which consists of two or more directional antennas which receive the electric wave which is characterized by providing the following, and which is arranged focusing on the same axis at a radial, is connected to a predetermined consecutiveness circuit, and comes from all directions grade A change means to change either of said directional antennas to said consecutiveness circuit, and to connect The nondirectional antenna which adjoins said directional antenna, is arranged focusing on said axis, and emits a trial electric wave The reflective member which carries out incidence of the electric wave emitted from this nondirectional antenna to said each of directional antenna

[Claim 2] Said reflective member is arranged so that the perimeter of said nondirectional antenna may be surrounded. While constituting from a reflecting plate of the truncated-cone configuration which carries out opening to said directional-antenna side and enabling the rotation drive of this reflecting plate focusing on said axis in order to carry out incidence of said trial electric wave to each directional antenna The antenna unit according to claim 1 characterized by arranging the wave absorber which absorbs said trial electric wave over the perimeter except said a part of reflective inside on the reflective inside of said reflecting plate.

[Claim 3] Said change means is an antenna unit according to claim 1 characterized by consisting of two or more cable run open/close switches formed in the way of each cable run which connects said nondirectional antenna and consecutiveness circuit, respectively.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the antenna unit which can be checked easily [ the actuation situation of the consecutiveness circuit connected with each directional antenna at them ], and certainly in the aerial which receives the electric wave which comes from all directions grade with two or more directional antennas.

[0002]

[Description of the Prior Art] Drawing 7 is the block diagram showing the configuration of the conventional antenna unit, and is set to drawing. The directional antenna by which array installation is carried out along a horizontal plane at a radial 1a-1h, A circuit changing switch for 2 to connect one to a consecutiveness circuit someday among said each antennas 1a-1h, the coupler inserted 3a-3h, respectively between said each antennas 1a-1h and circuit changing switches 2, and 4 are distributors which distribute the power of an input signal. In addition, a consecutiveness circuit is the processing circuit which carries out processing processing of the \*\*\*\* signal received by each antennas 1a-1h, and is outputted as a predetermined signal (for example, signal for a voice output or graphic display), or a processing circuit which judges the arrival direction of an electric wave based on the \*\*\*\* signal received by each antennas 1a-1h here. Moreover, the connection circuit changing switch which changes any shall be connected to a circuit changing switch 2 between the signal from Antennas 1a-1h and the signal from a distributor 4 instead of Couplers 3a-3h may be prepared.

[0003] Next, actuation is explained. In the usual reception actuation, each antennas 1a-1h \*\*\*\* the incidence electric wave from [ which each

has ] radiation, and send this \*\*\*\* signal to a circuit changing switch 2 through the couplers 3a-3h connected to each. And a circuit changing switch 2 outputs suitably the \*\*\*\* signal inputted from each antennas 1a-1h to a change \*\*\*\*\* circuit, and a predetermined signal is taken out from these assistant \*\*\*\*\* in a consecutiveness circuit, or the arrival direction of an electric wave etc. is judged.

[0004] On the other hand, in the test actuation which checks the actuation situation of equipment, a distributor 4 doubles and distributes the stimulus inputted from the outside to an Antennas [ 1a-1h ] number (eight pieces in this case), and delivery and each couplers 3a-3h pour this stimulus into each cable run which connects a circuit changing switch 2 to Antennas 1a-1h at Couplers 3a-3h. Then, the poured-in stimulus is outputted to a consecutiveness circuit through a circuit changing switch 2. For this reason, the actuation situation of an antenna unit can be checked by analyzing the signal outputted from a consecutiveness circuit in this case.

[0005]

[Problem(s) to be Solved by the Invention] since the conventional antenna unit is constituted as mentioned above, in order to pour in a stimulus -- Antennas [ 1a-1h ] Couplers 3a-3h or the connection circuit changing switch mentioned above of only a number -- required -- further -- a stimulus -- these antennas 1 -- since the distributor 4 which boils, respectively and is distributed a-1h was required, the more the number of antennas increased, components mark increased and, the more there was a trouble that a circuit became complicated and will become expensive.

[0006] Moreover, since a stimulus was not poured in through Antennas 1a-1h, the each antennas [ 1a-1h ] actuation situation could not be checked, but had the trouble that Antennas [ 1a-1h ] abnormalities were undetectable.

[0007] Furthermore, since a situation which an electric wave comes from a predetermined direction and is received by Antennas 1a-1h with the above-mentioned conventional equipment cannot be made in a tentative way When it is what has the function (bearing detection function) to compare the receiving level said whose consecutiveness circuits are each antennas 1a-1h, and to judge the arrival direction (the direction of incidence) of an electric wave () That is, when an antenna unit was used as some of so-called bearing detection equipments, there was a trouble of being unable to check the situation of this bearing detection function of operation.

[0008] In addition, the intermediary is not indicated by means to solve the above-mentioned trouble or this etc. although there are some which

were shown, for example in JP,1-254007,A etc. as a conventional technique relevant to this invention.

[0009] It was made in order that this invention might cancel the above troubles, and few, a circuit is easy, it is cheap, and components mark aim at offering the antenna unit which can check the actuation situation of the whole equipment which moreover also includes the function of an antenna or a consecutiveness circuit.

[0010]

[Means for Solving the Problem] The antenna unit concerning invention according to claim 1 is arranged focusing on the same axis at a radial. A change means to be connected to a predetermined consecutiveness circuit, and to be the antenna unit which consists of two or more directional antennas which receive the electric wave which comes from all directions grade, and to change either of said directional antennas to said consecutiveness circuit, and to connect, Focusing on said axis, said directional antenna is adjoined, it is arranged, and the nondirectional antenna which emits a trial electric wave, and the reflective member which carries out incidence of the electric wave emitted from this nondirectional antenna to said each of directional antenna are provided.

[0011] The antenna unit concerning invention according to claim 2 is set to an antenna unit according to claim 1. Said reflective member is arranged so that the perimeter of said nondirectional antenna may be surrounded. While the reflective member of the truncated-cone configuration which carries out opening to said directional-antenna side constitutes and enabling the rotation drive of this reflective member focusing on said axis in order to carry out incidence of said trial electric wave to each directional antenna On the reflective inside of said reflective member, the wave absorber which absorbs said trial electric wave is arranged over the perimeter except said a part of reflective inside.

[0012] The antenna unit concerning invention according to claim 3 consists of two or more cable run open/close switches which formed said change means in the way of each cable run which connects said nondirectional antenna and consecutiveness circuit, respectively in an antenna unit according to claim 1.

[0013]

[Function] The nondirectional antenna in invention according to claim 1 is emitted from the perimeter by making the stimulus from the outside into an electric wave. Then, it reflects by the reflective member and this radiated wave is inputted into each directional antenna. For this

reason, if a change means is changed one by one, each directional antenna is connected to a consecutiveness circuit and the output signal in the consecutiveness circuit in this case etc. is analyzed to a stimulus, the reception actuation situation of each directional antenna and a consecutiveness circuit can be checked.

[0014] Moreover, the trial electric wave which reflects it with a reflecting plate since the wave absorber in invention according to claim 2 absorbs the trial electric wave emitted from a nondirectional antenna except for some reflecting plates, and carries out incidence to a directional-antenna side can be set to the part in which said wave absorber is not prepared in the reflecting plate. And since a rotation drive is possible for the reflecting plate which constitutes a reflective member, it can change the location of the trial electric wave reflected without being absorbed in this way over the perimeter.

[0015] For this reason, when the actual receiving situation that an electric wave comes can be made in a tentative way and a consecutiveness circuit has a bearing detection function from specific bearing, the actuation situation of this function can also be checked. Namely, what is necessary is to carry out various setup of the location which is made to rotate said reflecting plate and a trial electric wave reflects, and just to analyze the judgment result of the bearing detection function in the consecutiveness circuit in this case to said setting location.

[0016] Furthermore, since the change means in invention according to claim 3 consists of two or more cable run open/close switches formed in the way of each cable run which connects a nondirectional antenna and a consecutiveness circuit, respectively, even if its number of directional antennas increases, equipment can only consist of easily increasing the number of components (namely, said cable run open/close switch) of the same kind.

[0017]

[Example] Drawing 1 -3 explain one example of invention according to claim 1 below example 1. The side elevation in which drawing 1 shows arrangement of each style element, the bottom view in which drawing 2 shows arrangement of each component, and drawing 3 are the block diagrams showing connection of each component. The axis which is the core of an each antennas [ 1a-1h (directional antenna) ] array that A was arranged by the radial along the horizontal plane in drawing 1 , The nondirectional antenna of the shape of a drum arranged considering Axis A as a core by the height in which 11 adjoins the each antennas [ 1a-1h ] bottom, 12 is the reflecting plate (reflective member) of the truncated-cone configuration which it is arranged [ configuration ] so

that the perimeter and the top face of a nondirectional antenna 11 may be surrounded, and carries out incidence of the trial electric wave to each antennas 1a-1h. In addition, in drawing 1 -3, the same sign is given to the same element as the conventional equipment shown in said drawing 7 .

[0018] Next, actuation is explained. The nondirectional antenna 11 in the above-mentioned antenna unit is emitted from the perimeter by making into an electric wave the stimulus inputted from the outside. Then, it reflects by the reflective inside 13 which inclines so that it may open to each antenna 1a-1h side in a reflecting plate 12, and this radiated wave is inputted into each antennas 1a-1h. For this reason, if a circuit changing switch 2 (change means) is changed one by one, each antennas 1a-1h are connected to a consecutiveness circuit and the output signal in the consecutiveness circuit in this case etc. is analyzed to a stimulus, the reception actuation situation of each antennas 1a-1h and a consecutiveness circuit can be checked.

[0019] And according to the above-mentioned equipment, only by making a circuit changing switch 2 correspond to it, and changing it, even when making an antennas [ for reception / 1a-1h ] number increase further, since the usual reception actuation and the above-mentioned test actuation become possible, components mark can be maintained few and a circuit can be kept easy. Namely, what is necessary is in the case of the conventional equipment shown in drawing 7 mentioned above, only for a part for the antenna for reception to have increased to have to increase a Couplers [ 3a-3h ] number, while changing a circuit changing switch 2 and a distributor 4 to what has a big capacity, but just to construct a nondirectional antenna 11 and a reflecting plate 12 one to the last in the case of the above-mentioned equipment. Therefore, the more there are many antennas for reception, the more it is effective in the ability to make the configuration of equipment easier than before and plan cost reduction.

[0020] Drawing 4 and 5 explain example 2., next one example of invention according to claim 2. Drawing 4 and 5 are the side elevations or bottom views showing arrangement of a component. In drawing 4 and 5, 14 is the wave absorber with which it was equipped except for the part on the reflective inside 13 of a reflecting plate 12, and the reflecting plate 12 has the composition of rotating said axis A as a core by the rotation driving means which carried out the illustration abbreviation.

[0021] Next, actuation is explained. Since the wave absorber 14 in the above-mentioned antenna unit absorbs the trial electric wave emitted from a nondirectional antenna 11 except for some reflecting plates 12,



it can set the trial electric wave which reflects with a reflecting plate 12 and carries out incidence to Antennaa [ 1 ]-1h side to the part in which the wave absorber 14 is not formed in the reflecting plate 12. And since a rotation drive is possible for a reflecting plate 12, it can change the location of the trial electric wave reflected without being absorbed in this way over the surroundings perimeter of Axis A.

[0022] For this reason, when the actual receiving situation that an electric wave comes can be made in a tentative way and a consecutiveness circuit has a bearing detection function from specific bearing, the actuation situation of this function can also be checked. That is, if various setup of the location which is made to rotate a reflecting plate 12 and a trial electric wave reflects is carried out and the judgment result of the bearing detection function in the consecutiveness circuit in this case is analyzed to a setting location, the abnormalities of said function or degradation of the engine performance is detectable.

[0023] Drawing 6 explains example 3., next one example of invention according to claim 3. In drawing 6 , 15a-15h, it is two or more cable run open/close switches formed in the way of each cable run which connects a nondirectional antenna 11 and a consecutiveness circuit, respectively, and the change means equivalent to the circuit changing switch 2 in said example 1 is constituted.

[0024] The case of this equipment also has the following effectiveness further, although the conventional distributor 4 and conventional Couplers 3a-3h in equipment can be deleted and cost reduction can be planned, while being able to check the reception actuation situation of the equipment of an example 1, and the whole equipment which includes Antennas 1a-1h similarly. That is, even if an Antennas [ 1a-1h ] number increases, since a change means can constitute equipment only from always increasing the number of components (namely, said cable run open/close switch) of the same kind, while it can plan cost reduction notably by volume efficiency etc., it becomes easy to manage [ of the components in the erector of equipment degree etc. ] it.

[0025]

[Effect of the Invention] As mentioned above, according to invention according to claim 1, it is arranged focusing on the same axis at a radial. A change means to be connected to a predetermined consecutiveness circuit, and to change either of the directional antennas of the antenna unit which consists of two or more directional antennas which receive the electric wave which comes from all directions grade to said consecutiveness circuit, and to connect, The nondirectional antenna which adjoins said directional antenna, is

arranged focusing on said axis, and emits a trial electric wave, Since it constituted so that the reflective member which carries out incidence of the electric wave emitted from this nondirectional antenna to said each of directional antenna might be provided, while an antenna unit becomes easy and being able to plan cost reduction, the abnormalities of the antenna for reception itself etc. can be detected. When there are many especially antennas, large cost reduction can be realized.

[0026] Furthermore, according to invention according to claim 2, a reflective member is arranged so that the perimeter of a nondirectional antenna may be surrounded. While the reflective member of the truncated-cone configuration which carries out opening to a directional-antenna side constitutes and enabling the rotation drive of this reflective member focusing on an axis in order to carry out incidence of the trial electric wave to each directional antenna Since it constituted so that the wave absorber which absorbs said trial electric wave might be arranged over the perimeter except said a part of reflective inside on the reflective inside of said reflective member, when the consecutiveness circuit connected to an antenna has bearing detection, it is effective in the abnormalities of this function etc. being detectable.

[0027] Moreover, since it constituted from two or more cable run open/close switches which formed the change means in the way of each cable run which connects a nondirectional antenna and a consecutiveness circuit, respectively according to invention according to claim 3, while being able to plan cost reduction still more notably, it is effective in the parts control in the erector of equipment degree etc. becoming easy.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the side elevation of the antenna unit by one example of invention according to claim 1.

[Drawing 2] It is the bottom view of the antenna unit by one example of invention according to claim 1.

[Drawing 3] It is the block diagram showing the connection condition of each component of the antenna unit by one example of invention according to claim 1.

[Drawing 4] It is the side elevation of the antenna unit by one example of invention according to claim 2.

[Drawing 5] It is the bottom view of the antenna unit by one example of invention according to claim 2.

[Drawing 6] It is the block diagram showing the antenna unit by one example of invention according to claim 3.

[Drawing 7] It is the block diagram showing the conventional antenna unit.

[Description of Notations]

1a-1h Directional antenna

2 Change Means

11 Nondirectional Antenna

12 Reflecting Plate (Reflective Member)

13 Reflective Inside

14 Wave Absorber

15a-15h Cable run open/close switch

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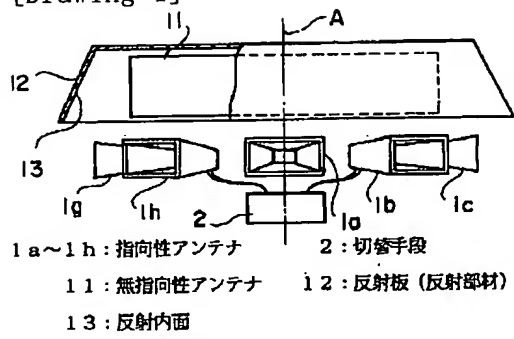
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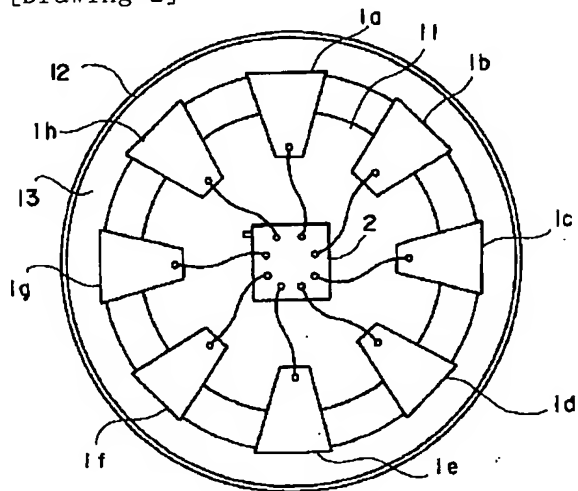
DRAWINGS

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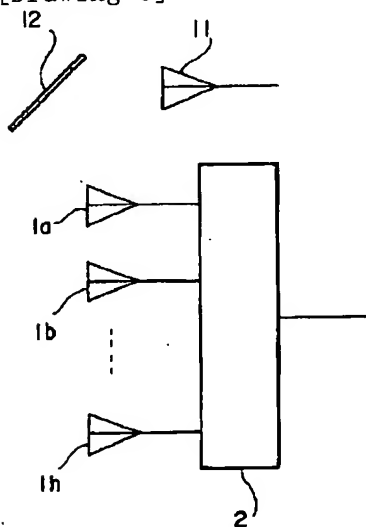
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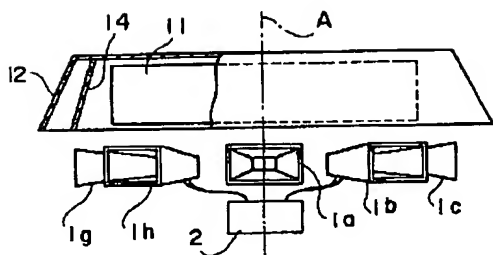
[Drawing 2]



[Drawing 3]

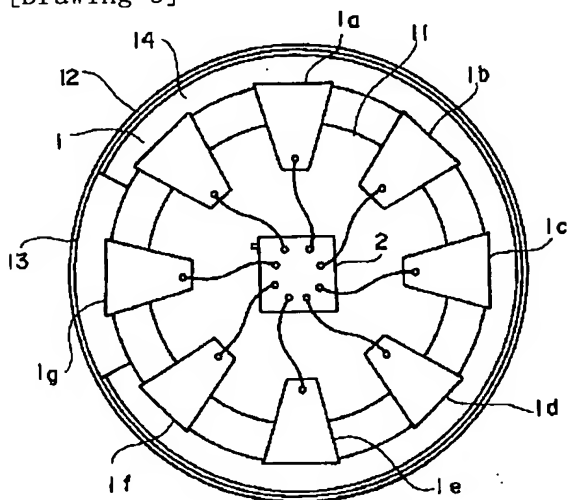


[Drawing 4]

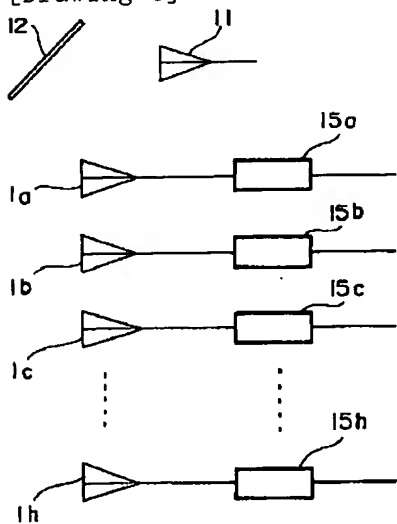


14 : 電波吸収体

[Drawing 5]

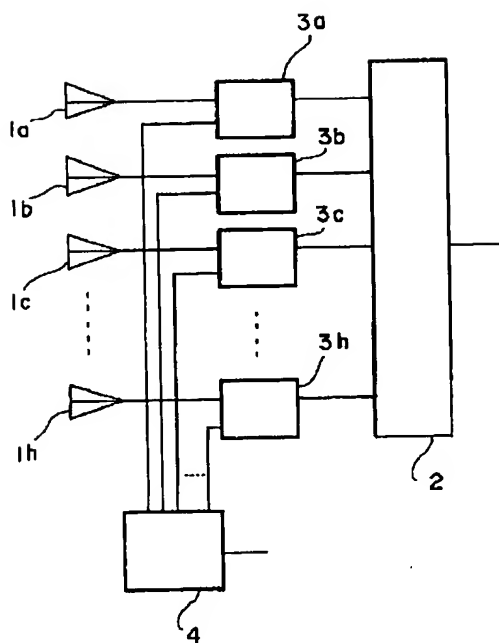


[Drawing 6]



15a~15h : 電路開閉スイッチ

[Drawing 7]



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[Translation done.]